

REMARKS/ARGUMENTS

Claims 1-13 are pending. Claim 1 is amended to change "less than 5.0%" to --0.5% - 4.5%--. Support for this amendment can be found throughout the specification and the drawings. For example, the Qrr waveform in Fig. 10 and the corresponding description in paragraph [0034] provide support for the claimed range:

"The Qrr waveform in FIG. 10 shows a minimum point at about 2.5% Schottky structure contribution and rises rapidly with increasing Schottky structure area."

Additional support for the claimed range can be found in Fig. 11 and the corresponding description in paragraph [0034]:

"The normalized efficiency results of these tests are shown in FIG. 11. This result indicates that the low-side switch with 2.5% Schottky has the highest value (compared to other Schottky structure contribution percentages) at the maximum of the efficiency curves."

Thus, it is believed that the specification and the drawings provide the necessary support for claim 1 amendments.

Claim 5 is amended to be made more clear. Claims 6 and 7 which depend from claim 1 are amended to address an antecedent basis problem. Specifically, reference to "second" trench is deleted from claims 6 and 7 because "second" trench is first introduced in claim 5, not claim 1.

Claims 11 and 12 are herein canceled without prejudice. Claim 13 which previously depended from claim 1 is herein amended to be made independent, and includes substantially all limitations of the amended claim 1. Support for the claim 13 amendment can be found throughout the specification and the drawings, and in particular in Figs. 4A and 4B and their corresponding description in the specification. Newly added claims 14-17 depend from claim 13, and roughly correspond to dependent claims 2-5. Newly added claim 18 depends from

claim 13. Support for all newly added claims 14-18 can be found throughout the specification and the drawings.

The title is amended to be made more descriptive of the claimed invention.

Paragraph [0001] of the specification is similarly amended.

No new matter is believed added by the claim and specification amendments.

Claim Rejections

In the Final Office action dated May 15, 2006, claims 1-8 and 12 were rejected as being unpatentable over US Patent No. 6,351,018 to Sapp (hereinafter "Sapp") in view of US Patent No. 5,111,253 to Korman et al. (hereinafter "Korman").

In the Office action, the Examiner relies on Korman stating that "Korman teaches Schottky diode occupies between 5% and 50% of the active area. (See col. 8, lines 23-25)." It is respectfully submitted that claim 1 as amended not only recites a range ("0.5%-4.5%") which clearly does not fall within the 5% - 50% range disclosed in Korman, but Korman clearly teaches away from the claimed lower percentages:

It is preferred to have the Schottky diode occupy between about 5% and about 50% of the active device area, although greater than 10% is considered preferable, because of the decrease in beneficial effect with decreasing Schottky diode percentage."
[Column 8, lines 23-28; emphasis are added]

Here, Korman makes clear that lower than 10% Schottky area is not desirable because of the corresponding "decrease in beneficial effect." This explicit denouncing of lower percentages by Korman clearly amounts to Korman teaching away from the claimed range. Thus, Korman teaches away from Schottky areas less than 10% and certainly less than 5%.

In light of the above, applicants respectively request reconsideration and withdrawal of the rejection of claim 1 and its dependent claims based on the cited references.

Newly added claims 13-18

Independent claim 13 includes a similar limitation to that of claim 1 discussed above, and is thus believed to be allowable for at least the same reason stated above. Another

distinguishing feature of claim 13 is the claimed first trench with a "gate electrode" and a "shield electrode" therein. In rejecting claim 13, the Examiner relied on the combination of US Patent No. 5,998,833 to Baliga (hereinafter "Baliga") with the Korman and Sapp references. It is respectfully submitted that none of the three references provide the motivation for combining the three references in the manner suggested by the Examiner.

Neither Sapp nor Korman contemplates or suggests monolithic integration of Schottky diode with a field effect transistor having a trench structure with first and second conductive materials therein, as recited in claim 13. Baliga on the other hand, merely discloses a trench structure with a gate electrode and a source electrode therein. Baliga nowhere suggests that such trench structure may be monolithically integrated with a Schottky diode. Given that none of the three cited references set forth any motivation for combining Baliga's teachings with those of Korman and Sapp in the manner suggested by the Examiner, it is believed that Examiner's suggested combination of the three references amounts to impermissible hindsight reconstruction.

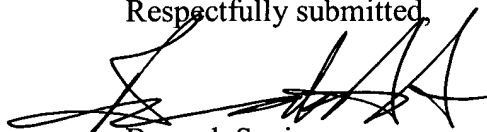
Accordingly, applicants believe newly added claims 13-18 are allowable over the cited references.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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